```
RRRRRRRRRRRR      UUU           UUU  NNN        NNN   000000000    FFFFFFFFFFFFFFF   FFFFFFFFFFFFFFFFF
RRRRRRRRRRRR      UUU           UUU  NNN        NNN   000000000    FFFFFFFFFFFFFFF   FFFFFFFFFFFFFFFFF
RRRRRRRRRRRR      UUU           UUU  NNN        NNN   000000000    FFFFFFFFFFFFFFF   FFFFFFFFFFFFFFFFF
RRR        RRR    UUU           UUU  NNN        NNN   000      000  FFF               FFF
RRR        RRR    UUU           UUU  NNN!       NNN   000      000  FFF               FFF
RRR        RRR    UUU           UUU  NNN        NNN   000      000  FFF               FFF
RRR        RRR    UUU           UUU  NNNNNN     NNN   000      000  FFF               FFF
RRR        RRR    UUU           UUU  NNNNNN     NNN   000      000  FFF               FFF
RRR        RRR    UUU           UUU  NNNNNN     NNN   000      000  FFF               FFF
RRRRRRRRRRRR      UUU           UUU  NNN  NNN   NNN   000      000  FFFFFFFFFFF       FFFFFFFFFFF
RRRRRRRRRRRR      UUU           UUU  NNN  NNN   NNN   000      000  FFFFFFFFFFF       FFFFFFFFFFF
RRRRRRRRRRRR      UUU           UUU  NNN  NNN   NNN   000      000  FFFFFFFFFFF       FFFFFFFFFFF
RRR    RRR        UUU           UUU  NNN     NNNNNN   000      000  FFF               FFF
RRR    RRR        UUU           UUU  NNN     NNNNNN   000      000  FFF               FFF
RRR    RRR        UUU           UUU  NNN        NNN   000      000  FFF               FFF
RRR        RRR    UUU           UUU  NNN        NNN   000      000  FFF               FFF
RRR        RRR    UUU           UUU  NNN        NNN   000      000  FFF               FFF
RRR        RRR    UUU           UUU  NNN        NNN   000      000  FFF               FFF
RRR        RRR    UUUUUUUUUUUUUUUUU  NNN        NNN   000000000    FFF               FFF
RRR        RRR    UUUUUUUUUUUUUUUUU  NNN        NNH   000000000    FFF               FFF
RRR        RRR    UUUUUUUUUUUUUUUUU  NNN        NNN   000000000    FFF               FFF
```

FILEID**NDXVRS

```
NN     NN DDDDDDD  XX    XX  VV     VV RRRRRRR   SSSSSSSS
NN     NN DDDDDDD  XX    XX  VV     VV RRRRRRR   SSSSSSSS
NN     NN DD    DD  XX  XX   VV     VV RR    RR SS
NN     NN DD    DD   XXXX    VV     VV RR    RR SS
NNNN   NN DD    DD   XXXX    VV     VV RR    RR SS
NNNN   NN DD    DD   XXXX    VV     VV RR    RR SS
NN NN  NN DD    DD    XX     VV     VV RRRRRRR   SSSSSS
NN NN  NN DD    DD    XX     VV     VV RRRRRRR   SSSSSS
NN  NNNN DD    DD   XXXX    VV     VV RR RR          SS
NN  NNNN DD    DD   XXXX     VV   VV  RR  RR         SS
NN   NN DD    DD  XX    XX   VV VV    RR   RR        SS
NN   NN DD    DD  XX    XX   VV VV    RR   RR        SS
NN     NN DDDDDDD  XX    XX    VVV    RR    RR SSSSSSSS   ....
NN     NN DDDDDDD  XX    XX    VV     RR    RR SSSSSSSS   ....

LL         IIIIII    SSSSSSSS
LL         IIIIII    SSSSSSSS
LL           II    SS
LL           II    SS
LL           II    SS
LL           II      SSSSSS
LL           II      SSSSSS
LL           II          SS
LL           II          SS
LL           II          SS
LLLLLLLLLL IIIIII  SSSSSSSS
LLLLLLLLLL IIIIII  SSSSSSSS
```

```
    1    0001  0  %TITLE 'Main module -- DSR / DSRPLUS INDEX Utility'
    2    0002  0  MODULE NDXVRS     (MAIN = $INDEX,
    3    0003  0                     IDENT = 'V04-000'
    4    0004  0                     %BLISS32[, ADDRESSING_MODE(EXTERNAL = LONG_RELATIVE, NONEXTERNAL = LONG_RELATIVE)]
    5    0005  0                     ) =
    6    0006  0
    7    0007  1  BEGIN
    8    0008  1
    9    0009  1  !
   10    0010  1  !****************************************************************
   11    0011  1  !*                                                              *
   12    0012  1  !*   COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                    *
   13    0013  1  !*   DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.     *
   14    0014  1  !*   ALL RIGHTS RESERVED.                                       *
   15    0015  1  !*                                                              *
   16    0016  1  !*   THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED  *
   17    0017  1  !*   ONLY IN  ACCORDANCE WITH  THE  TERMS  OF  SUCH  LICENSE  AND WITH THE  *
   18    0018  1  !*   INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR  ANY  OTHER  *
   19    0019  1  !*   COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY  *
   20    0020  1  !*   OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY  *
   21    0021  1  !*   TRANSFERRED.                                               *
   22    0022  1  !*                                                              *
   23    0023  1  !*   THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE  *
   24    0024  1  !*   AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
   25    0025  1  !*   CORPORATION.                                               *
   26    0026  1  !*                                                              *
   27    0027  1  !*   DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS  *
   28    0028  1  !*   SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.     *
   29    0029  1  !*                                                              *
   30    0030  1  !*                                                              *
   31    0031  1  !****************************************************************
   32    0032  1  !
   33    0033  1
   34    0034  1  !++
   35    0035  1  !  FACILITY:
   36    0036  1  !    DSR (Digital Standard RUNOFF) /DSRPLUS DSRINDEX/INDEX Utility
   37    0037  1  !
   38    0038  1  !  ABSTRACT:
   39    0039  1  !
   40    0040  1  !      Defines the version number for TOPS-20 and VAX versions.
   41    0041  1  !      Changes whenever INDEX code changes and describes the change.
   42    0042  1  !
   43    0043  1  !  VERSION PREFIX CHARACTER CONVENTIONS:
   44    0044  1  !
   45    0045  1  !      While building a new version:    X
   46    0046  1  !      Final link, but internal:        E
   47    0047  1  !      Released version:                V
   48    0048  1  !
   49    0049  1  !  ENVIRONMENT:    Transportable
   50    0050  1  !
   51    0051  1  !  AUTHOR:      JPK
   52    0052  1  !
   53    0053  1  !  CREATION DATE: June 1982
   54    0054  1  !
   55    0055  1  !  MODIFIED BY:
   56    0056  1  !
   57    0057  1  !      028      JPK00024          23-May-1983
```

```
  58      0058   1 |         Modified lowercasing algorithm in PERMUTE. Now lowercase only
  59      0059   1 |         if word contains only 1 letter or if second letter in word is
  60      0060   1 |         lowercase. Picked up modules PAGMRG and POOL from DSR/DSRPLUS
  61      0061   1 |         since they are no longer used by DSR/DSRPLUS.
  62      0062   1 |
  63      0063   1 |  027    JPK00023           20-May-1983
  64      0064   1 |         Modified INDEX, NDXT20 and NDXVMS to check status of
  65      0065   1 |         $XPO_PARSE_SPEC to avoid error messages from XPORT.
  66      0066   1 |
  67      0067   1 |  026    JPK00022           12-Apr-1983
  68      0068   1 |         Modified NDXVMS, NDXFMT, NDXPAG, NDXVMSMSG and NDXVMSREQ
  69      0069   1 |         to generate TEX output. Added module NDXTEX.
  70      0070   1 |
  71      0071   1 |  025    JPK00021           28-Mar-1983
  72      0072   1 |         Modified NDXT20 to include E2.0 functionality.
  73      0073   1 |         Modified NDXCLIDMP, NDXFMT, NDXPAG, NDXVRS to require RNODEF
  74      0074   1 |         for BLISS36 and to remove any conditional require based on
  75      0075   1 |         DSRPLUS_DEF.
  76      0076   1 |
  77      0077   1 |  024    JPK00020           17-Mar-1983
  78      0078   1 |         Modified NDXFMT to generate a ".NO PAGING" in the prologue
  79      0079   1 |         for /LAYOUT=GALLEY
  80      0080   1 |
  81      0081   1 |  023    JPK00019           14-MAR-1983
  82      0082   1 |         Modified NDXVMS to conditionalize /PAGE_NUMBERS=[NO]MERGE
  83      0083   1 |         and /PAGE_NUMBERS=STANDARD for DSRPLUS only.
  84      0084   1 |
  85      0085   1 |  022    JPK00018           09-Mar-1983
  86      0086   1 |         Modified INDEX to handle new BRN format.
  87      0087   1 |         Modified NDXOUT to handle specifyable levels on SORT= string.
  88      0088   1 |         Modified NDXFMT to output new RUNOFF prologue.
  89      0089   1 |         Modified NDXPAG to output new TMS prologue and RUNOFF epilogue.
  90      0090   1 |
  91      0091   1 |  021    JPK00017           23-Feb-1983
  92      0092   1 |         Modified NDXINI to initialize the zero'th entries of LLINES,
  93      0093   1 |         RLINES and TLINES which is where the telltale strings are
  94      0094   1 |         stored by NDXFMT.
  95      0095   1 |         Modified NDXFMT to write appropriate prologue for /TELLTALE,
  96      0096   1 |         save the appropriate lines for left and right telltales, and
  97      0097   1 |         to mark the end of every entry with a NULL.
  98      0098   1 |         Modified NDXPAG to change the NULL following each entry to a
  99      0099   1 |         space if LAYOUT is SEPARATE or to a comma otherwise and to
 100      0100   1 |         generate and output telltales.
 101      0101   1 |
 102      0102   1 |  020    JPK00016           23-Feb-1983
 103      0103   1 |         Modified NDXVMS to change the default number of lines per page
 104      0104   1 |         when /TELLTALE is specified but /LINES is not.
 105      0105   1 |
 106      0106   1 |  019    JPK00015           04-Feb-1983
 107      0107   1 |         Cleaned up module names, modified revision history to
 108      0108   1 |         conform with established standards. Updated copyright dates.
 109      0109   1 |
 110      0110   1 |  018    JPK00014           02-Feb-1983
 111      0111   1 |         Modified PERMUTE to remove extra whitespace in index entries.
 112      0112   1 |         Changed module name.
 113      0113   1 |
 114      0114   1 |  017    JPK00013           31-Jan-1983
```

NDXVRS   Main module -- DSR / DSRPLUS INDEX Utility   16-Sep-1984 01:15:44 VAX-11 Bliss-32 V4.0-742   Page 3
V04-000   14-Sep-1984 13:07:22 [RUNOFF.SRC]NDXVRS.BLI;1   (1)

H 1

```
 115  0115  1 |              Changed default subindex level value from 6 to 99 in NDXVMS
 116  0116  1 |              and NDXCLIDMP. This value is the subindexing level.
 117  0117  1 |              It is NOT A HEADER LEVEL.
 118  0118  1 |
 119  0119  1 |       016    JPK00012           24-Jan-1983
 120  0120  1 |              Modified NDXVMSMSG.MSG to define error messages for both
 121  0121  1 |              DSRINDEX and INDEX.
 122  0122  1 |              Added require of NDXVMSREQ.R32 to NDXOUT, NDXFMT, NDXDAT,
 123  0123  1 |              INDEX, NDXMSG, NDXXTN, NDXTMS, NDXVMS and NDXPAG for BLISS32.
 124  0124  1 |              Since this file defines the error message literals,
 125  0125  1 |              the EXTERNAL REFERENCEs for the error message literals
 126  0126  1 |              have been removed.
 127  0127  1 |
 128  0128  1 |       015    JPK00011           24-Jan-1983
 129  0129  1 |              Changed CMDBLK [NDX$G_LEVEL] to CMDBLK [NDX$H_LEVEL]
 130  0130  1 |              Changed CMDBLK [NDX$H_FORMAT] to CMDBLK [NDX$H_LAYOUT]
 131  0131  1 |              Changed CMDBLK [NDX$V_TMS11] and CMDBLK [NDX$V_TEX] to CMDBLK [NDX$H_FORMAT]
 132  0132  1 |              Changed comparisons of (.CHRSIZ EQLA CHRSZA) to
 133  0133  1 |              (.CMDBLK [NDX$H_FORMAT] EQL TMS11_A).
 134  0134  1 |              Definitions were changed in NDXCLI and references to the
 135  0135  1 |              effected fields were changed in NDXPAG, NDXFMT, INDEX, NDXVMS
 136  0136  1 |              and NDXCLIDMP.
 137  0137  1 |
 138  0138  1 |       014    JPK00010           24-Jan-1983
 139  0139  1 |              Removed routines GETDAT and UPDDAT from NDXDAT - they
 140  0140  1 |              performed no useful function. Removed references to these
 141  0141  1 |              routines from NDXOUT, NDXFMT, and NDXMSG.
 142  0142  1 |              Removed reference to XPOOL in NDXOUT - not used.
 143  0143  1 |
 144  0144  1 |       013    JPK00009           24-Jan-1983
 145  0145  1 |              Modified to enhance performance. The sort buckets have each
 146  0146  1 |              been divided into 27 sub-buckets; 1 for each letter and 1
 147  0147  1 |              for non-alphas. Removed reference to BUCKET from INDEX.
 148  0148  1 |              Definition of the structure was added to NDXPOL. References
 149  0149  1 |              to BUCKET were changed in modules NDXOUT, NDXINI, NDXFMT
 150  0150  1 |              and NDXDAT.
 151  0151  1 |
 152  0152  1 |       012    RER00002           20-Jan-1983
 153  0153  1 |              Modified VMS command line interface module NDXVMS:
 154  0154  1 |                - changed /FORMAT qualifier to /LAYOUT.
 155  0155  1 |                - changed use of /RESERVE and /REQUIRE for DSRPLUS.
 156  0156  1 |                - added code for new DSRPLUS qualifiers /FORMAT and
 157  0157  1 |                  /TELLTALE_HEADINGS.
 158  0158  1 |              Added fields to NDXCLI for new qualifiers: NDX$V_TELLTALE
 159  0159  1 |              and NDX$V_TEX.
 160  0160  1 |              Conditionalized output of NDX$V_PAGE_MERGE in NDXCLIDMP to
 161  0161  1 |              account for different DSR and DSRPLUS default values.
 162  0162  1 |
 163  0163  1 |       011    REM00001           11-Jan-1983
 164  0164  1 |              Modified command line dumper NDXCLIDMP:
 165  0165  1 |                - Updated copyright date.
 166  0166  1 |                - Added more subtitles and paging.
 167  0167  1 |                - Conditionalized output to only report items that are
 168  0168  1 |                  other then the default values.
 169  0169  1 |                - Added output of an identifying header.
 170  0170  1 |
 171  0171  1 |       010    RER00001           17-Dec-1982
```

NDXVRS
V04-000

Main module -- DSR / DSRPLUS INDEX Utility   I 1
                                              16-Sep-1984 01:15:44   VAX-11 Bliss-32 V4.0-742
                                              14-Sep-1984 13:07:22   [RUNOFF.SRC]NDXVRS.BLI;1

Page 4
(1)

```
 172   0172  1 |          Modified VMS command line interface module NDXVMS:
 173   0173  1 |          - Added code to treat keyword NORUNNING in same way as
 174   0174  1 |            keyword STANDARD.
 175   0175  1 |          - Added code for new DSR qualifiers /RESERVE and /REQUIRE.
 176   0176  1 |          - Changed header level default value from 99 to 6.
 177   0177  1 |          - Conditionalized code to compile for DSRPLUS if BLISS
 178   0178  1 |            /VARIANT = 8192 is used; otherwise, to compile for DSR.
 179   0179  1 |          - Deleted foreign-command code; INDEX is now called
 180   0180  1 |            as a subcommand of DSR.
 181   0181  1 |
 182   0182  1 |    009   JPK00008          19-Nov-1982
 183   0183  1 |          Changed name of POOL.REQ to DMDEFS.REQ in NDXXTN.
 184   0184  1 |
 185   0185  1 |    008   JPK00007          24-Sep-1982
 186   0186  1 |          Reset PAGENO if not concatenated input in INDEX.
 187   0187  1 |
 188   0188  1 |    007   JPK00006          24-Sep-1982
 189   0189  1 |          Modified NDXFMT to ignore REQUIRE file if filename string
 190   0190  1 |          is null. Added bold guide headings for RUNOFF output.
 191   0191  1 |
 192   0192  1 |    006   JPK00005          24-Sep-1982
 193   0193  1 |          Removed definition of CHRFWD in NDXINI. No longer needed.
 194   0194  1 |
 195   0195  1 |    005   JPK00004          24-Sep-1982
 196   0196  1 |          Modified NDXOUT, NDXMSG, NDXFMT, and NDXDAT for TOPS-20.
 197   0197  1 |          Strings stored in the index pool use the first fullword
 198   0198  1 |          for their length. References to these strings were incorrect.
 199   0199  1 |
 200   0200  1 |    004   JPK00003          24-Sep-1982
 201   0201  1 |          Modified NDXPAG for TOPS-20. A 'SIGNAL' was not conditionalized
 202   0202  1 |          to produce an $XPO_PUT_MSG if not %BLISS (BLISS32).
 203   0203  1 |          Modified to add requested /TMS=E changes.
 204   0204  1 |
 205   0205  1 |    003   JPK00002          16-Sep-1982
 206   0206  1 |          Fix transaction mapping bug in INDEX. This bug occurred only
 207   0207  1 |          when processing more than one input file where a file in the
 208   0208  1 |          middle of the sequence contained no indexing information.
 209   0209  1 |          If there had been only one transaction previous to the
 210   0210  1 |          empty file, the resulting page numbers would be incorrect
 211   0211  1 |          but the error would not be discovered by INDEX. If there
 212   0212  1 |          were more than one transaction preceeding the empty file,
 213   0213  1 |          transaction numbers would appear out of sequence which would
 214   0214  1 |          be reported by INDEX as an internal logic error.
 215   0215  1 |
 216   0216  1 |    002   JPK00001          13-Aug-1982
 217   0217  1 |          Removed reference to CLI$END_PARSE in NDXVMS. It is no longer
 218   0218  1 |          supported by VMS.
 219   0219  1 |--
 220   0220  1
 221   0221  1 REQUIRE 'REQ:RNODEF';                      !RUNOFF definition
 222   0352  1
 223   0353  1 FORWARD ROUTINE
 224   0354  1     $INDEX;
 225   0355  1
 226   0356  1 !
 227   0357  1 ! GLOBAL STORAGE:
 228   0358  1 !
```

```
229    0359 1
230 L  0360 1 %IF DSRPLUS
231 U  0361 1 %THEN
232 U  0362 1
233 U  0363 1 GLOBAL
234 U  0364 1     NDXVRP : INITIAL (CH$PTR (UPLIT ('X2.8'))),      ! Version # string
235 U  0365 1     NDXVRL : INITIAL (4);                            ! Length of version string
236 U  0366 1
237    0367 1 %ELSE
238    0368 1
239    0369 1 GLOBAL
240    0370 1     NDXVRP : INITIAL (CH$PTR (UPLIT ('V2.1-12'))),   ! Version # string
241    0371 1     NDXVRL : INITIAL (7);                            ! Length of version string
242    0372 1
243    0373 1 %FI
244    0374 1
245    0375 1 !
246    0376 1 ! EXTERNAL REFERENCES:
247    0377 1 !
248    0378 1 EXTERNAL ROUTINE
249    0379 1     NDXCLI;
250    0380 1
251    0381 1 GLOBAL ROUTINE $INDEX
252    0382 1
253 L  0383 1 %IF %BLISS(BLISS36)
254 U  0384 1 %THEN
255 U  0385 1
256 U  0386 1     %IF %SWITCHES(TOPS10)
257 U  0387 1     %THEN
258 U  0388 1
259 U  0389 1         ( P1, P2, P3, P4, CCL_OFFSET )
260 U  0390 1
261 U  0391 1     %FI
262 U  0392 1
263    0393 1 %FI
264    0394 1
265    0395 1     = NDXCLI (
266    0396 1
267 L  0397 1 %IF %BLISS(BLISS36)
268 U  0398 1 %THEN
269 U  0399 1
270 U  0400 1     %IF %SWITCHES(TOPS10)
271 U  0401 1     %THEN
272 U  0402 1
273 U  0403 1         .P1, .P2, .P3, .P4, .CCL_OFFSET
274 U  0404 1
275 U  0405 1     %FI
276 U  0406 1
277    0407 1 %FI
278    0408 1
279    0409 1     );
```

```
                                        .TITLE  NDXVRS Main module -- DSR / DSRPLUS INDEX Utili
                                                ty
                                        .IDENT  \V04-000\
```

```
                                                                        .PSECT  $SPLIT$,NOWRT,NOEXE,2

                    00  32  31  2D  31  2E  32  56  00000 P.AAA:   .ASCII  \V2.1-12\<0>

                                                                        .PSECT  $GLOBAL$,NOEXE,2

                                          00000000'  00000 NDXVRP::.ADDRESS P.AAA
                                          00000007'  00004 NDXVRL::.LONG   7

                                                                        .EXTRN  NDXCLI

                                                                        .PSECT  $CODE$,NOWRT,2

                                          0000 00000         .ENTRY  $INDEX, Save nothing          ; 0393
                    00000000G EF       00  FB 00002         CALLS   #0, NDXCLI                    ; 0395
                                          04 00009         RET                                    ; 0409
```

; Routine Size: 10 bytes,   Routine Base: $CODE$ + 0000

```
;  280        0410 1
;  281        0411 1 END                        ! End of module
;  282        0412 0 ELUDOM
```

;
;
;   PSECT SUMMARY
;
;   Name   Bytes   Attributes
; $SPLIT$ 8 NOVEC,NOWRT, RD NOEXE,NOSHR, LCL, REL, CON,NOPIC,ALIGN(2)
; $GLOBAL$ 8 NOVEC, WRT, RD ,NOEXE,NOSHR, LCL, REL, CON,NOPIC,ALIGN(2)
; $CODE$ 10 NOVEC,NOWRT, RD , EXE,NOSHR, LCL, REL, CON,NOPIC,ALIGN(2)

;   COMMAND QUALIFIERS

;   BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/LIS=LIS$:NDXVRS/OBJ=OBJ$:NDXVRS MSRC$:NDXVRS/UPDATE=(ENH$:NDXVRS)

; Size: 10 code + 16 data bytes
; Run Time: 00:02.5
; Elapsed Time: 00:08.3
; Lines/CPU Min: 9770
; Lexemes/CPU-Min: 8276
; Memory Used: 13 pages
; Compilation Complete

NEWPAG
LIS

NODOPX
LIS

OUTTXT
LIS

OFT
LIS

NDXVRS
LIS

NDXVRS
LIS

NOTE
LIS

OUTLIN
LIS

NM
LIS

PACK
LIS

OUTXHR
LIS

NDXXTN
LIS

NDXXTN
LIS

OUTCHA
LIS

OUTHDR
LIS